

AMENDMENTS TO THE CLAIMS

1. (Currently Amended) ~~A refractive index coupling distributed feedback semiconductor laser comprising:~~
opposed first and second end surfaces through which light generated within the semiconductor laser may be emitted;

a central phase-shift structure located substantially centrally between the first and second end surfaces; and

first and second diffraction gratings respectively extending from the central phase-shift structure to the first and second end faces and having respective, different periods,
~~wherein when viewed from an almost central portion in a light distributed feedback direction in a region in which diffraction gratings are located, an average coupling coefficient κ_2 of a the second diffraction grating on one end face side is smaller than an average coupling coefficient κ_1 of a the first diffraction grating on other end face side, and the coupling coefficient κ_2 exceeds 100 cm^{-1} .~~

2. (Currently Amended) ~~A complex coupling The distributed feedback semiconductor laser in which an~~ according to claim 1, wherein absolute value of a real part of a coupling coefficient is at least four times ~~an absolute value of an imaginary part of the coupling coefficient, comprising a phase shift structure, wherein when viewed from an almost central portion in a light distributed feedback direction in a region in which diffraction gratings are located, an average coupling coefficient κ_2 of a diffraction grating on one end face side is smaller than an average coupling coefficient κ_1 of a diffraction grating on other end face side, and the coupling coefficient κ_2 exceeds 100 cm^{-1} .~~

3. (Currently Amended) The distributed feedback semiconductor laser according to claim 1, including a plurality of phase-shift structures located at almost substantially symmetrical positions about a with respect to the central portion in a light distributed feedback direction in a region ~~phase-shift structure and in which the first and second diffraction gratings are located.~~

Claims 4 and 5 (Cancelled).

6. (Currently Amended) The distributed feedback semiconductor laser according to claim 1, wherein ~~when a cycle structure each of the first and second diffraction grating is viewed in a light distributed feedback direction, a value of (duty gratings includes alternating regions of a high higher and lower refractive index portion)/(duty of a low index materials~~

and the ratio of higher to lower refractive index portion) materials is larger in a region having the coupling coefficient κ_1 is larger than the value in a region having the coupling coefficient κ_2 .

7. (Currently Amended) The distributed feedback semiconductor laser according to claim 1, wherein, in each of the first and second diffraction gratings includes alternating regions of higher and lower refractive index materials, the regions having a higher refractive index have a layer layered structure having a high refractive index in the diffraction grating, and the number of high refractive index layers of the higher refractive index regions in the first diffraction grating and having the coupling coefficient κ_1 is larger than the number of high refractive index layers of the higher refractive index materials in the second diffraction grating having the coupling coefficient κ_2 .

8. (Currently Amended) The distributed feedback semiconductor laser according to claim 1, wherein a layer of a low refractive index between a layer of a high refractive index in supporting the first and second diffraction grating and an active layer of the laser gratings has a thickness smaller in the a region having the coupling coefficient κ_1 than in the a region having the coupling coefficient κ_2 .

9. (Currently Amended) The distributed feedback semiconductor laser according to claim 1, wherein, when an equivalent refractive index acting when light is propagated through the in a region having the coupling coefficient κ_2 is represented by n_2 , an equivalent refractive index acting when light is propagated through the in a region having the coupling coefficient κ_1 is represented by n_1 , an average cycle the period of the second diffraction grating in the region having the coupling coefficient κ_2 is represented by Λ_2 , and an average cycle the period of the first diffraction grating in the region having the coupling coefficient κ_1 is represented by Λ_1 , and $n_2 \cdot \Lambda_2$ is almost substantially equal to $n_1 \cdot \Lambda_1$.

This listing of claims replaces all prior versions, and listings, of claims in the application.